

**REMARKS**

Claims 9-12 and 15-24 are pending in this application. Claims 9 and 10 are amended herein. Upon entry of this amendment, claims 9-12 and 15-24 will be pending. Entry of this amendment and reconsideration of the rejections are respectfully requested.

No new matter has been introduced by this Amendment. Support for the amendments to the claims is detailed below.

**Claims 10 and 11 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. (Office action paragraph no. 4)**

The Examiner states that claim 10 allows for a combination of (B2) and (C1a), due to the conjunction “and,” while base claim 9 does not allow this combination.

The rejection is overcome by the amendment to claim 10. The amendment clarifies that claim 10 further limits the definitions of (B1), (B2) and (C), which are recited in claim 9. For example, in claim 9, (B1) is a C<sub>6</sub> to C<sub>32</sub> saturated or unsaturated aliphatic alcohol. In claim 10, (B1) is further limited at least one member selected from the group consisting of lauryl alcohol, myristyl alcohol, palmityl alcohol, stearyl alcohol and behenyl alcohol, all of which are within the definition of (B1) of claim 9. The conjunction “or” has accordingly been deleted in the claim.

In addition, a minor amendment is made correcting the punctuation in claim 9 by adding commas where parentheses had been deleted in the previous amendment.

**Claims 9, 12, and 15-23 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kobayashi '615 (US 6,238,615) in view of Kobayashi '863 (US 5,120,863). (Office action paragraph no. 5)**

The Examiner states that the Kobayashi '615 reference discloses a composition comprising polyolefin resin and dibenzylidene sorbitol, and teaches the addition of a melting point depressant such as 12-hydroxystearic acid, which is a component (B2). The Examiner states that Kobayashi '615 fails to disclose addition of di(C<sub>8</sub> to C<sub>22</sub> alkyl or alkenyl), that is, component (C3). The Examiner cites Kobayashi '863 as disclosing dibenzyl sorbitol compounds with an added aliphatic amine such as distearylmethylamine, which prevents discoloration and reduces odor. The Examiner states that it would have been obvious to add a dialkylmethylamine to the polyolefin resin composition of Kobayashi '615.

Reconsideration of the rejection is respectfully requested in view of the attached evidence of unexpected results commensurate with the scope of the pending claims. Specifically, claim 9 recites a method for suppressing aldehyde generation by thermal decomposition of diacetal (A) (formula (1)), and requires that **both components (B) and (C) be added** to the diacetal (A). The effects of the present invention are associated with the addition of **both** components (B) and (C) as recited in claim 9, and are not seen with only the addition of one of these components, as in the cited references.

Experimental evidence demonstrating the effects of the invention is presented in the attached Declaration under 37 CFR 1.132 by Reira Ikoma, dated October 20, 2009. The data in

the Declaration are summarized below, and then analyzed specifically in regard to Kobayashi '615 and Kobayashi '863.

Summary of the data in the Declaration

In Table I of the Declaration, eight Inventive examples (1, 2, a1-a8) are presented. The Inventive Examples involve mixing an isotactic random polypropylene resin or an isotactic homopolypropylene with components (A), (B) and (C) within the scope of claim 9. An injection-molded product is prepared and is evaluated for crystallization temperature, haze, odor, aldehyde generation and taste.

As can be seen in Table 1, several different DBS compounds are used as component (A). Component (B) is 12-hydroxystearic acid, which is an example of (B2), or lauryl alcohol or stearyl alcohol, which are examples of (B1). Component (C) is diethanolamine or triisopropanolamine which are examples of (C3), or sodium lauryl sulfate or sodium polyoxyethylene, examples of (C1).

In Table II of the Declaration, the Comparative Examples are presented. These Comparative Examples all have a DBS compound for component (A), but lack either component (B) or (C), and therefore do not meet the limitations of claim 9.

In general, as may be seen in Table II, the amount of aldehyde generation in the Comparative resin compositions, which contain only component (B) or component (C), was extremely high, at 3.7 to 4.7  $\mu\text{g}/\text{PPg}$ . This may be compared to the Inventive Examples in Table I, where aldehyde generation was 2.2-3.3  $\mu\text{g}/\text{PPg}$ . That is, aldehyde generation could not be sufficiently suppressed in the Comparative Examples.

Consequently, pellets and injection-molded products of the Comparative compositions exhibited unpleasant odors in the range of 7 to 10 in the odor evaluation. Further, the rating of the taste evaluation of the injection-molded products was also high, at 7 to 11. These may be compared to the Inventive Examples, in which odor was in the range of 3 to 5, and taste in the range of 2 to 5.

The data in the Declaration therefore demonstrate that the combination of component (A) with **both** components (B) and (C) is necessary to achieve the effects of reduced aldehyde generation and low odor and taste. The data will now be reviewed specifically with regard to the Kobayashi '615 and Kobayashi '863 references.

Unexpected results in particular regard to Kobayashi '615 and Kobayashi '863

As stated by the Examiner, Kobayashi '615 discloses a component (A) and an example of component (B2) (12-hydroxystearic acid), but does not disclose a component (C3). Kobayashi '863 discloses component (A) and an example of component (C3) (diethylmethylaniline), but not component (B). However, the data in the declaration demonstrate that the effects of the present invention require the **combination** of these components.

This may be seen by comparing Inventive Examples 1 and 2 to Comparative Examples b8 and b9, which have component (C3) but lack component (B). The Comparative Examples therefore correspond generally to Kobayashi '863. Inventive Examples 1 and 2 are superior to Comparative Examples b8 and b9 in both suppressing aldehyde generation and producing the effects of suppressing odor and the transfer of taste. This demonstrates that the effects of the present invention are **not solely due to component (C3)**: the effects cannot be fully

demonstrated unless the composition also contains the specific component (B). This **synergy** is clearly unexpected over either cited reference.

Further, Comparative Example 5 of the Declaration, which has component (B2) but not (C), proves that a resin composition that contains only component (B2) and not component (C) can neither sufficiently suppress aldehyde generation nor produce the effects of suppressing odor and the transfer of taste. This corresponds to the disclosure of Kobayashi '615, and again serves to demonstrate the synergy between components (B2) and (C3).

Applicant submits that these data in the Declaration adequately reproduce the closest prior art, and demonstrate a **synergy** between components (B2) and (C3), an effect that is commensurate in scope with claim 9. Since neither of the cited references suggests both components (B2) and (C3), this synergistic effect of the present invention is clearly unexpected over the cited references, and claims 9, 12, and 15-23 are not obvious over Kobayashi '615 (US 6,238,615) and Kobayashi '863 (US 5,120,863), taken separately or in combination.

**Claims 9, 12, and 15-23 are rejected under 35 U.S.C. §103(a) as being unpatentable over WO '851 (WO 98/33851) in view of Kobayashi '863 (US 5,120,863).** (Office action p. 3)

The Examiner cites WO '851 (Kobayashi '254) for disclosing a diacetal composition comprising benzylidene sorbitol and a binder such as behenyl alcohol (citing column 6, line 67), where the diacetal is added to polyolefins. The Examiner cites Kobayashi '863, as above, for disclosing adding an aliphatic amine such as distearyltrimethylamine to dibenzylidene sorbitol. The Examiner states that since the addition of the dialkylmethyl amine results in the reduction of

odor, it would have been obvious to add that to the polyolefin resin composition of WO '851 (US '254).

Reconsideration of the rejection is respectfully requested in view of the evidence of unexpected results in the attached Declaration under 37 CFR 1.132. The data in Tables I and II of the Declaration have been generally explained above in regard to the rejection in Office action paragraph no. 2, and here are reviewed specifically with regard to the WO'851 and Kobayashi '863 references.

Unexpected results over WO'851 and Kobayashi '863

As noted above, WO '851 discloses a component corresponding to component (B1) of the present invention but is silent about component (C3). Kobayashi '863 discloses a component corresponding to (C3) of the present invention, but does not disclose a component (B).

The evidence in the present Declaration demonstrates that there is a synergy associated with the combination of components (B1) and (C3). As discussed above, comparative Examples b8 and b9 of the attached declaration compared to Inventive examples 1 and 2 clearly show that a resin composition that contains component (C3) and not component (B2) is incapable of fully producing the effects of the present invention. This effect is also demonstrated for the combination of (B1) and (C3), as may be seen by comparing Comparative Example b8, which lacks a component (B), to Inventive Example a8, which has stearyl alcohol (B1). Inventive Example a8 is clearly superior to Comparative Example b8.

In addition, Comparative Examples 1 to 4 of the Declaration contain a component corresponding to component (B1) of the present invention and not component (C), corresponding generally to the cited disclosure in WO '851. These Comparative Examples are inferior to the

Inventive Examples, again demonstrating that the effect of the present invention is a **synergistic** effect requiring **both** components (B) and (C). Since neither of the cited references suggests both components (B1) and (C3), this synergistic effect of the present invention is clearly unexpected over the cited references, and claims 9, 12, and 15-23 are not obvious over WO '851 and Kobayashi '863 (US 5,120,863), taken separately or in combination.

**Claims 9-12, and 15-23 are rejected under 35 U.S.C. §103(a) as being unpatentable over WO '851 (WO 98/33851) in view of Kobayashi '843 (US 6,245,843).** (Office action paragraph no. 6)

The Examiner cites WO '851 for disclosing a diacetal composition comprising benzylidene sorbitol and a binder such as behenyl alcohol (citing column 6, line 67), where the diacetal is added to polyolefins. The Examiner cites Kobayashi '843 for disclosing a benzylidene sorbitol composition for use with polyolefins, and cites the reference as disclosing the addition of a sulfate binder such as a sulfate salt (citing column 9, lines 45-55), such as sodium lauryl sulfate, so that the diacetal composition dissolves or disperses into the molten polyolefin resin. The Examiner states that it would have been obvious to add sulfate salts into the binder of WO '851 (US '254).

Reconsideration of the rejection is respectfully requested in view of the evidence of unexpected results in the attached Declaration under 37 CFR 1.132. The data in Tables I and II of the Declaration have been generally explained above in regard to the rejection in Office action paragraph no. 2.

Unexpected results over WO '851 and Kobayashi '843

As described above, WO '851 discloses a component corresponding to component (B1) of the present invention but is silent about component (C), and Kobayashi '843 discloses a component corresponding to (C1) of the present invention.

The unexpected effects of the present invention may be seen by review of Comparative Examples b1, b2 and b4-b7, which contain sodium lauryl sulfate, as in Kobayashi '843. Comparative Examples 1-4 also have alkyl alcohols, and may be considered similar to the disclosure in WO '851. These may be compared, for example, to Inventive Examples a1, a2, and a4-a8, which have both an aliphatic alcohol (B1) and sodium lauryl sulfate (C1). The Inventive Examples are all superior to the Comparative Examples, demonstrating that there is a **synergy** associated with the presence of **both** (B1) and (C1), and this effect is completely unexpected over WO '851 and Kobayashi '843. Claims 9-12 and 15-23 are therefore not obvious over WO '851 and Kobayashi '843, taken separately or in combination.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact the applicants' undersigned agent at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

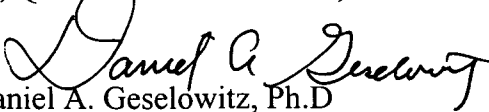


U.S. Patent Application Serial No. **10/500,867**  
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In the event that this paper is not timely filed, the applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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Enclosures: Petition for Extension of Time

Declaration under 37 CFR §1.132 signed by Mr. Reira Ikoma

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